

- 21 -

What is claimed is:

1 1. A method for automatically generating a framed digital image, comprising:
2 analyzing a portion of a first data set representing rows and columns of pixels of an
3 unframed digital image so as to identify at least one image characteristic for the digital
4 image;
5 determining at least one frame attribute based on the at least one image
6 characteristic; and
7 generating a second data set representing rows and columns of pixels of the framed
8 digital image, the pixels defining a representation of the unframed digital image
9 surrounded by a frame having the at least one frame attribute.

1 2. The method of claim 1, wherein the analyzing includes:
2 mapping the pixels of the first data set to a two-dimensional image space; and
3 selecting at least one region of the two-dimensional image space for analysis.

1 3. The method of claim 2, wherein the at least one region is a single region
2 encompassing all pixels.

1 4. The method of claim 2, wherein each at least one region includes a subset of all
2 pixels.

1 5. The method of claim 1, wherein the analyzing includes:

- 22 -

2 mapping the pixels of the first data set to a three-dimensional color space; and
3 selecting at least one region of the three-dimensional color space for analysis.

1 6. The method of claim 5, wherein the selecting is performed in accordance with a
2 principal component analysis technique.

1 7. The method of claim 5, wherein, for each region, the analyzing further includes:
2 identifying at least one of a dominant color, a dominant lightness, a pixel
3 concentration, a color space component volume, and a color space component density.

1 8. The method of claim 1, wherein the at least one image characteristic is selected
2 from the group consisting of color temperature, contrast ratio, colorfulness, and color
3 strength.

1 9. The method of claim 1, wherein the determining is further based on a
2 predetermined relationship between at least some of the image characteristics and
3 individual frame attributes.

1 10. The method of claim 1, wherein the determining further comprises:
2 assigning the unframed digital image to an image category based on the at least
3 one image characteristic; and
4 choosing the at least one frame attribute based on the image category.

1 11. The method of claim 10, wherein the choosing further comprises:

- 23 -

2 mapping the image category to at least one framing rule for a corresponding at
3 least one framing scheme parameter; and
4 determining the at least one frame attribute according to the at least one framing
5 rule.

1 12. The method of claim 10, wherein the image category is selected from the
2 group consisting of portrait, landscape, floral, city, industrial, and night.

1 13. The method of claim 9, wherein one of the framing scheme parameters is color
2 scheme, and wherein the at least one framing rule specifies a color scheme selected from
3 the group consisting of same, similar, progressive, complementary, contrasting,
4 achromatic, vivid, dark, and light.

1 14. The method of claim 9, including:
2 modifying the predetermined relationship prior to the defining.

1 15. The method of claim 1, including:
2 sending the second data set to an imaging device for producing the framed digital
3 image.

1 16. The method of claim 1, wherein the representation of the unframed digital
2 image is scaled in the framed digital image.

- 24 -

1 17. The method of claim 1, wherein the at least one frame attribute is selected from
2 the group consisting of a border color, a border width, a border texture pattern, at least
3 one shading color, and a number of borders per frame.

1 18. An image processing apparatus, comprising:
2 an image analyzer adapted to receive and process a first data set having rows and
3 columns of pixels representing an unframed digital image so as to define at least one frame
4 attribute of a frame that is visually attractive to the unframed digital image; and
5 a framed image generator communicatively coupled to the image analyzer for
6 processing the first data set and the at least one image attribute so as to automatically
7 generate a second data set having rows and columns of pixels representing a framed digital
8 image including a representation of the unframed digital image surrounded by a frame
9 having the at least one frame attribute.

1 19. The image processing apparatus of claim 18, the image analyzer further
2 comprising
3 a component identifier adapted to receive the first data set and identify at least one
4 individual image component therefrom;
5 a component characterizer communicatively coupled to the component identifier
6 for determining at least one component characteristic for certain ones of the individual
7 image components;

- 25 -

8 an image characterizer communicatively coupled to the component characterizer
9 for determining at least one image characteristic from the at least one component
10 characteristic; and
11 an image categorizer communicatively coupled to the image characterizer for
12 automatically defining the at least one frame attribute from the at least one image
13 characteristic.

1 20. The image processing apparatus of claim 19, further comprising:
2 a memory accessible by the image categorizer, the image categorizer automatically
3 defining the at least one frame attribute in accordance with at least one framing scheme
4 parameter stored in the memory.

1 21. The image processing apparatus of claim 20, wherein the memory is writeable,
2 further comprising:
3 a user interface communicatively coupled to the memory for modifying the at least
4 one framing scheme parameter.

1 22. A program storage medium readable by a computing apparatus and embodying
2 a program of instructions executable by the computing apparatus for automatically
3 generating a visually pleasing framed digital image from an unframed digital image, the
4 program storage medium comprising:

- 26 -

5 a first logical segment of the instructions configured to analyze a portion of a first
6 data set representing rows and columns of pixels of the unframed digital image so as to
7 identify at least one image characteristic for the digital image;

8 a second logical segment of the instructions configured to determine at least one
9 frame attribute based on the at least one image characteristic; and

10 a third logical segment of the instructions configured to generate a second data set
11 representing rows and columns of pixels of the framed digital image, the pixels defining a
12 representation of the unframed digital image surrounded by a frame having the at least one
13 frame attribute.

Patent Application 10004754